

Drainage

To give you an idea of the importance of drainage, the various NYS highway agencies currently spend more than 25 percent of their annual road budgets on drainage. Let's assume for a moment that our highway agency (The Road Association) should follow that example. That means last year we should have allocated almost \$10,000 of our maintenance monies to road contouring, ditching, and culverts. We didn't come close, mostly because we have not made drainage an annual plan priority for many years. That needs to change.

Have you ever considered why some areas of the road are far worse than others? There are some signs that our road is trying to tell us about water. While there are exceptions, here are some general observations for you to consider.

Potholes on the road are generally worse on properties which have homes and other structures on the WEST SIDE of the road. The road on properties with homes on the EAST SIDE of the road seem to fare better in terms of potholes and road deterioration. And, WEST SIDE two stories seem to produce worse results than WEST SIDE single stories.

The same is true of foliage and fences. Properties that have a lot of foliage/fences on the WEST SIDE of the road seem to have more road potholes than areas of the road on the EAST SIDE with a clearer view of the lake.

What is going on here? The answer should be obvious, and, as always is WATER! Consider the fact that because of our unique location at the bottom of a big hill (cliff for many of us), not only does it take the eastern rising sun behind us a long time to shine down on our little road, but the road intercepts all of the water travelling down that 45 degree slope on our east side regardless of the time of day. Even in the summer, we generally don't get much direct sun before noon, and if the western sun is blocked by the stuff we have added to our properties, the road in some sections may only see several hours of direct sun.

The average humidity in Central New York is well above 50% at least 8 months out of the year which means it is going to be really tough to dry out everything. If the sun can't get to the road because of structures and foliage in addition to our unique geography, the road stays wet and structurally weak because it is water-laden. Add some heavy trucks and we have the perfect recipe for potholes. In reviewing the archives, it is no coincidence that the years where the road has been in the "best shape ever!" have all been severe drought years. Of course then in those years we all complain about dust, so it's hard to ever get a win on Honoco.

So, if we can't plan on the sun helping us very much, what are our other options? There are two kinds of drainage that we need to plan for in order to help dry us out and have a chance at minimizing potholes and rutting. **Roadway Drainage** is the control of water within the roadway including moving water off the surface of the road and removing excess water infiltrating the road base and subgrade. **Roadside Drainage** is controlling the water beyond the roadway, including the water coming from the roadway surface. This includes water in ditches, culverts, and water coming down our cliff.

Roadway drainage is a combination of using the right materials in the right proportions for the surface, base, and subgrade of the road, as well as proper contouring of the surface to both direct surface water

through and to the sides of the road. It is essential that the base be clean (very little “dirt”) and free-draining. If water gets trapped in the base because it is filled with dirt, frost-heaving and the spring thaws will quickly destroy the road. Even the railroad way back when knew that silt-filled ballast under their tracks was a recipe for disaster and so they would frequently send high pressure water tank cars down the tracks to blast the silt from the ballast in order to keep it free-draining. Unfortunately we are likely long past the point of properly choosing the right materials in the right proportions for the various layers of our road, which mostly leaves us with trying to manage the top layer with stone additions and contouring. Let’s hope we can make it work.

Roadside drainage on Honoco unfortunately has been haphazard at best, and has been significantly compromised by parking carve-outs on the east side of some properties. Essential ditching (at least open ditching) is no longer possible in some of these areas. In a good road design, the entire east side of Honoco would have had a series of either open trench ditches or French drains that feed into a series of culverts that direct all of the intercepted water from the cliff as well as that drained from the road surface to the west side of the road and into the lake. It is unfortunately a little too late for that. As long as our existing ditches either intercept and/or collect water and deliver it to somewhere else, preferably the lake, ditching works to our benefit. However, if ditches don’t drain somewhere away from the road, a ditch can be our worst enemy. Ditches that don’t drain anywhere are “ponds” and we have a bunch of them on the road. The water simply pools in the depression and slowly evaporates and/or seeps into the surrounding soil. This is particularly troublesome on our road, because the water path is definitely from the top of the hill to the lake, and our road is not going to prevent that from happening. Consequently the water runs UNDERNEATH the road to get to the lake, and in the process softens the road base which leads to deterioration of whatever is above the base. In addition, if there is no east side ditch, the water from one of our spring downpours has no place to go but across the top of the road, and in so doing washes all of the fines that hold the surface stones together into the lake.

In terms of culverts on Honoco, we have far fewer than we need, many are undersized, the majority of our gully culverts lack debris dams to minimize debris plugs and subsequent road blockages, and some of our culverts are packed with debris from lack of maintenance. Other than that we are in fine shape (just kidding). Surprisingly, we can’t tell you how many culverts there are on Honoco, what their sizes are, and where they are located. The gully ones are obvious, but we have more. The last effort to do this was when Larry Lipfert was president, and unfortunately we never memorialized his efforts. Why is it important? It is hard to maintain what you don’t know you have. One of the things we hope to do this year is get a volunteer crew together that will take a complete infrastructure inventory of the road, especially after a severe spring storm with heavy rainfall. Do we have the right drainage in place for where we currently need it? Hard to tell until we make an effort to find out.

Let’s say that as a result of that inventory we find an area of the road that definitely has an unaddressed drainage issue. Among the main problems with culverts is that they are expensive to buy, expensive to install, and expensive to maintain. Homeowners generally won’t install them unless they are experiencing water damage to their property and usually undersize them to save costs. And, hardly anyone on the road is willing to drop several thousand dollars on a culvert that doesn’t directly benefit their property. Can’t blame them there. So we have been looking at some options, one of which is called “Broad Based Dips”.

The main function of a “broad based dip” is to collect flowing water from the road surfaces and ditches, and direct it across the road surface to an area where it can drain into the lake. You probably have never

heard of them because they are only suited for low traffic volume roads like ours. They can be used in place of culverts to outlet water across the road and are cheap, easy, and effective. The idea is to create a “high spot” and two “low spots” on a typical parcel by taking road material from a portion of both the beginning and the end of the road on a parcel and adding it to the center. The height difference over say a typical 120 ft long parcel would be slightly over a foot, which would hardly be noticeable in 120 ft of road. The low spots would be sloped towards the lake side. Think of it as a really big road “crown” in the wrong direction. Surface water on the road would run down the road, in opposite directions from the high point, reach the low points, and drain off the road towards the lake. If you didn’t have a gully on your property, where a culvert is an absolute must, this might be an inexpensive way to get water off our road surface. We might try it somewhere so stay tuned for updates.

We often hear that the runoff from many of our gullies has dramatically changed over the years and it is those blankety-blank farmers adding drain tiles to their fields that are causing all of our flooding problems. Land use can affect the amount of runoff, and even simple things like changing the direction of field furrows can alter the drainage in a watershed. In this regard the Cayuga County Water and Soil Conservation District has been a very helpful free resource for Honoco in providing information on our watersheds, estimating the runoff in a particular gully, and calculating the amount of flow from various storm sizes that determine the size of culverts required to handle the flow. They use a combination of Google satellite images as well as topographic maps to identify the watershed areas for a particular gully on Honoco. It is pretty impressive.

They have pointed out several facts about the area above Honoco Road. Much of the area is still heavily forested, which is ideal for absorbing runoff. The satellite images also show that there do not appear to be many active changes in the farm field architectures or new sources that would cause runoff changes. In addition, they noted that Honoco is 3.5 miles long, and that often times very heavy rain is quite localized. A storm crossing the lake on the southern end of Honoco, for example, may not even get to the northern watersheds on the road, leading to gully-washers on the southern Honoco watersheds and bone-dry gullies on the northern end, and vice versa.

Regardless of the source, our history shows that we have always been, and likely always will be, at frequent flooding risk on the road and that we need to be managing our road, ditches, and culverts to survive a severe storm and be in service quickly after the rain has lessened. We will never get to 100%, so we are endeavoring to put a specific Emergency Storm Response plan in place for the road in order to keep it open. We hope to give you a plan in our 2019 annual meeting.

In summary, our success in managing Honoco is directly tied to our ability to manage drainage on the road. Literally everything that makes (or doesn’t make) the road “passable” 365 days a year is related to water. We are not alone. Google “managing water on gravel roads” and you can read credible sources forever. The ones who have done it successfully have been informed, committed, and have a plan to make it happen. We hope we are one of those.